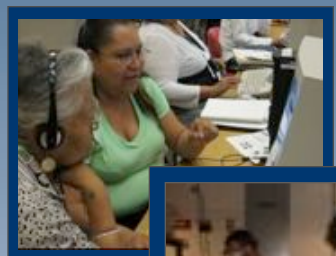
"AILDI has definitely changed my perception about education in multicultural settings."

"I am most proud of my accomplishments with the computer-aided-drafting program, SolidWorks. I downloaded this program three days into my six weeks here, and was immediately overwhelmed at having to learn the program well enough to design a multi-part assembly compatible with sensitive electrical components. With the time that my advisor gave me to learn on my own, as well as collaboration from others in the department, I was designing parts within days..... "

"This summer I worked with Atomic Force Microscopy (AFM), a visualization tool that allows us to explore structures in the nanoworld. Operating the instrument and fully understanding its many functions and variables takes a lot of patience, skills, and practice. At first I received blurry images and had to figure out how to properly adjust parameters as to improve the quality of the image. I look forward to translating this into the college laboratory: that good experimental technique is just as important as good ideas and good experimental design. "



"[AILDI] revives my spirit to know other Natives are doing similar work and struggling with the same issues. [AILDI] gives me better skills for teaching."

Example Research Topics

Semiconductor Nanostructure Devices
Atomic Trapping Properties of Electric Fields
Polarization Observations in Everyday Phenomena
Characterization of Optical Fibers for Communication
Electron Microscopy of Carbon Nanotubes
Fiber Optic Distribution of Solar Power

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The goals of the partnership between CIAN, AILDI, and science educators working in Native American communities are:

- Advance Native American pre-college students' interest in science and engineering careers through the compelling and informative lessons developed by their teachers
- Provide classes on teaching methods for culturally relevant and appropriate science education for Native American students
- Develop an understanding of the role of Indigenous knowledge in the sciences and in all areas of language and cultural revitalization
- Long-term collaborative relationships between K-14 STEM teachers and the University of Arizona community

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CIAN CENTER FOR INTEGRATED ACCESS NETWORKS

Research Experience for K-14 Teachers

NSF-funded
Engineering Research Center
in partnership with
American Indian Language Development Institute

6-week Summer Research/ Curriculum Development Programs at:

The University of Arizona
June 7 - July 16, 2010

Deadline:
April 21, 2010
Applications online at:
http://www.optics.arizona.edu/cian/applyteach.htm

Research in Optics for K-14 Educators and Teachers *ROKET*

What is AILDI?

For 31 years AILDI has been leading efforts to document, revitalize and promote Indigenous languages, reinforcing the processes of intergenerational language transfer.

What is Optics?

Studying physical properties of light and the interaction of light and matter is the field of optics. The communication devices of the future will be faster (*e.g.* no pause while streaming YouTube) by transporting light photons instead of electricity. The direction and amplitude of light is manipulated by discrete components such as waveguides, optical switches, optical modulators, and other optical analogs of current electronic technology. We'd like your help bringing the excitement of photonics engineering into your classroom!

Teachers Reflections

"AILDI – Ask, Information, Learn, Develop, and Implement. We as students come here to ask questions; our instructors give us information to answer our questions; we learn it; we develop that information into a plan to help us; then implement the plan to teach our children and community members our language."
- AILDI past participant

"... allowed me to explore a new field in science, nanoscience, something I had not previously taught in my classes. Thanks to my research mentor, who patiently guided me through the process, I feel confident that I can incorporate aspects of modern research into the first year college classroom. I also learned a great deal from my fellow teachers, graduates students, and through a variety of seminars and lectures. I look forward to a mutual collaboration that extends beyond the summer."
- Community College Faculty

"... as an Environmental Science teacher, I was anxious about math, physics, engineering, and optics; subjects that I was familiar with, but not at all comfortable with on a practical level. I learned that even though my background was not in subjects that are generally associated with the field, optical sciences is an applied science that has connections to nearly all scientific disciplines, including the Earth and Environment."
- High School Environmental Science Teacher

"This has been a very good experience for me and has given me confidence that I can take back."
- High School Science and Information Technology Teacher

" ... When the program began, I didn't know what to expect. I was afraid that the material was going to be beyond my understanding. Once I spoke to my faculty mentor, I had much more self confidence. We discussed ideas about using laser beams with an audio output for my population of students (visually impaired). At the end of six weeks, I had produced a wonderful laser beam communication kit....."
- High School Science Teacher for visually impaired students

Teacher Benefits

- Enroll in AILDI course *"Science Curriculum in Native American Education"* by Prof. Cajete
- Research experience in world-class UA optics laboratory
- Introduce your students to career paths and higher education in optical engineering
- Networking with research faculty, graduate student mentors, and other ambitious educators
- Supply budget of $1,500 for laboratory supplies and classroom demo materials
- Earn a $5,400 stipend
- Create original engineering lesson plans and publish this content on NSF database for educators: http://www.teachengineering.org/
- Travel to professional conferences to share your original curriculum

Eligibility

- Working in a school that primarily serves Native American students

AND

- K-12 teachers and community college faculty in scientific disciplines interested in increasing their knowledge of scientific research and bringing to their classrooms advanced information about optics, electronics, physics, materials science, and engineering